



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/802,726	03/12/2001	Peyman Hadizad	ONS00181	7690
7590	11/07/2003		EXAMINER	
Robert D. Atkins ON Semiconductor, Patent Administration Dept - MD A230 P.O. Box 62890 Phoenix, AZ 85082-2890			SCHILLINGER, LAURA M	
			ART UNIT	PAPER NUMBER
			2813	
DATE MAILED: 11/07/2003				

Please find below and/or attached an Office communication concerning this application or proceeding.

4/1

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/802,726	HADIZAD ET AL.	
	Examiner	Art Unit	
	Laura M Schillinger	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 29 July 2003.

2a) This action is **FINAL**.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-40 is/are pending in the application.

4a) Of the above claim(s) 18-40 is/are withdrawn from consideration.

5) Claim(s) 1-18 is/are allowed.

6) Claim(s) \_\_\_\_\_ is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 12 March 2001 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) Notice of References Cited (PTO-892)      4) Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)      5) Notice of Informal Patent Application (PTO-152)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.      6) Other: \_\_\_\_\_.

## **DETAILED ACTION**

**This Office Action is in response to Amendment C, dated 8/14/03 in Paper No. 9.**

### ***Drawings***

New corrected drawings are required in this application because the drawings have been made by hand and are generally illegible. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

### ***Election/Restrictions***

Newly submitted claims 39-40 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claims 39 and 40 are distinct from the original claims on the grounds that claim 39 includes a substrate with a first trench and a drain with a second trench, further claim 40 does not require a drain structure at all.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 39-40 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Allowable Subject Matter***

Claims 1-18 are allowed.

The following is an examiner's statement of reasons for allowance:

In reference to claim 1, Gardner teaches a component comprising:

A drain region having a trench with first and second sides, a portion of the semiconductor layer having a first conductivity type and a first charge density (Fig.3 (46) and Col.6, lines: 45-50- teaching to dope the substrate therefore forming a charge density);

A control electrode in the trench (Fig. 5 (54));

A channel region of the second conductivity type adjacent to the drain region and adjacent to the trench (Col.8, lines: 34-36); and

A first region adjacent to the drain region, having a second conductivity type (Fig.12 (60 and 66)).

However as Applicant has argued in Paper No. 5, Gardner does not teach a first region of second conductivity type and second charge density, which balances the first.

However, Luo ('421) teaches a charge balancing between opposing conductivity regions (Col.6, lines: 25-35) in a trench structure for a MOSFET.

However, even in combination Luo and Gardner fail to teach Applicant's claim limitation of having a first region with a first charge density balancing the second charge density where the

first region is **adjacent to the drain region** as claimed by the Applicant. Therefore Applicant's claim language is considered to be allowable and claims 1-18 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

This application is in condition for allowance except for the following formal matters: Applicant has traversed the Examiner's restriction of claims 31-38 and has not yet given permission to cancel the claims.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M Schillinger whose telephone number is (703) 308-6425. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W Whitehead, Jr. can be reached on (703) 308-4940. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

LMS

October 31, 2003

  
CARL WHITEHEAD, JR.  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800